1. An energy supply station for converting hydrocarbon fuel into at least one of hydrogen and electricity for subsequent delivery to a vehicle, said station comprising

one or more chemical converters positioned to receive fuel and for processing the fuel to form an output medium including carbon dioxide,

a separation stage for separating a chemical component from the output medium,

a collection element in fluid circuit with the separation stage for collecting the carbon dioxide, and

a vehicle interface for interfacing with the vehicle.

2. A co-production energy supply station for producing hydrogen and electricity from a hydrocarbon fuel, said station comprising

a plurality of chemical converters positioned to receive the hydrocarbon fuel and for processing the fuel to form an output medium including carbon dioxide, said chemical converters also generating the hydrogen and the electricity,

a separation stage for separating a chemical component from the output medium, and

a storage element in fluid circuit with the separation stage for storing the hydrogen before being dispensed.

3. The energy supply station of claim 1 or 2, wherein the hydrocarbon fuel includes one of natural gas, coal gas, propane, naphtha, gasoline, diesel fuel, methanol, and biogas.

4. The energy supply station of claim 1 or 2, further comprising a fuel treatment element for pre-treating the fuel prior to introduction to at least one of the chemical converters.

5. The energy supply station of claim 1 or 2, further comprising one or more vaporizers for heating and vaporizing a liquid reforming agent prior to introduction to at least one of the chemical converters.

6. The energy supply station of claim 1 or 2, further comprising one or more evaporators for heating and evaporating the fuel prior to introduction to at least one of the chemical converters.

7. The energy supply station of claim 5, wherein said vaporizer comprises a steam boiler or a heat recovery steam generator.

8. The energy supply station of claim 5, further comprising a mixer in fluid circuit with the vaporizer and adapted to receive the vaporized reforming agent and the fuel, said mixer being adapted to evaporate the fuel and to mix the reforming agent with the fuel.

9. The energy supply station of claim 8, further comprising a secondary heating stage disposed between the vaporizer and the mixer for heating the reforming agent prior to introduction to the mixer.

10. The energy supply station of claim 1 or 2, wherein the chemical converter comprises a reformer and the output medium includes hydrogen, water and carbon dioxide, and wherein the separation stage is adapted to isolate individually at least one of the hydrogen, water and carbon dioxide in the output medium.

11. The energy supply station of claim 10, further comprising means for supplying a reforming agent to the reformer suitable for converting the fuel into hydrogen and carbon monoxide as the products of an intermediate reaction that occurs therein.

12. The energy supply station of claim 11, wherein the reforming agent is one of air, water and steam.

13. The energy supply station of claim 10, further comprising a treatment stage for treating a reforming agent prior to introduction to the reformer.

14. The energy supply station of claim 13, wherein the treatment stage comprises a de-ionizer or a vaporizer.

15. The energy supply station of claim 14, wherein the de-ionizer processes the reforming agent with one of a de-ionizing resin and reverse osmosis.

16. The energy supply station of claim 1, wherein the chemical converter comprises at least one reformer and the output medium includes hydrogen, water and carbon dioxide, wherein the vehicle interface is configured to deliver hydrogen to the vehicle.

17. The energy supply station of claim 1 or 2, wherein said chemical converter comprises at least one fuel cell, and wherein said fuel cell produces electricity.

18. The energy supply station of claim 1, wherein said chemical converter comprises at least one fuel cell, and wherein said fuel cell produces electricity, and wherein said vehicle interface is adapted to exchange electricity between the vehicle and the station.

19. The energy supply station of claim 17, wherein the fuel cell is one of a solid oxide fuel cell, molten carbonate fuel cell, phosphoric acid fuel cell, alkaline fuel cell, and proton exchange membrane fuel cell.

20. The energy supply station of claim 1 or 2, further comprising a generator for producing electricity.

21. The energy supply station of claim 20, wherein the generator comprises at least one of a fuel cell, a gas turbine, an internal combustion engine and a sterling engine assembly.

22. The energy supply station of claim 20, wherein said generator comprises a fuel cell positioned to receive the hydrogen output of the reformer for electrochemically converting the hydrogen in the presence of an oxidant into electrical energy.

23. The energy supply station of claim 20, wherein the generator is a fuel cell, said fuel cell being one of a solid oxide fuel cell, molten carbonate fuel cell, phosphoric acid fuel cell, alkaline fuel cell, and proton exchange membrane fuel cell.

24. The energy supply station of claim 20, wherein said generator is selectively coupled to the vehicle interface to deliver electricity to the vehicle.

25. The energy supply station of claim 1 or 2, further comprising an inverter for inverting D.C. electricity generated by said chemical converter into AC current.

26. The energy supply station of claim 1 or 2, further comprising one or more of

a de-sulfurization unit for removing sulfur from the fuel or output medium,

at least one of a low and high temperature shift reactor for converting carbon monoxide and steam within the output medium into carbon dioxide and hydrogen, and

a hydrogen processor for processing hydrogen present within the output medium.

27. The energy supply station of claim 26, wherein the hydrogen processor comprises one of a mechanical compressor and an electrochemical compressor.

28. The energy supply station of claim 27, wherein the electrochemical compressor comprises one of a phosphoric acid, alkaline, and proton exchange membrane device.

29. The energy supply station of claim 1 or 2, wherein said output medium of said chemical converter includes steam, and wherein said separation stage comprises means for condensing the steam from the output medium, thereby enabling the separation of hydrogen and carbon dioxide from the output medium.

30. The energy supply station of claim 1 or 2, wherein said separation stage separates hydrogen from the output medium.

31. The energy supply station of claim 30, wherein said separation stage isolates said hydrogen from said output medium by one of physical absorption,

adsorption, low temperature distillation, high pressure liquefaction, membrane, enzyme, and molecular sieve separation of CO_2.

32. The energy supply station of claim 1 or 2, wherein said separation stage comprises one or more of means for forming a liquid or solid hydrogen compound to isolate hydrogen therefrom; means for cooling the output medium of the chemical converter to separate hydrogen therefrom; means for pressurizing the output medium of the chemical converter to separate hydrogen therefrom; and means for membrane filtering the output medium of the chemical converter to separate hydrogen therefrom.

33. The energy supply station of claim 1 or 2, further comprising a storage unit for storing the hydrogen separated from the output medium by said separation stage.

34. The energy supply station of claim 33, further comprising means for storing said hydrogen in said storage unit in one of a compressed gas state, solid state, aqueous state, and refrigerated state.

35. The energy supply station of claim 34, further comprising means for storing said hydrogen in said storage unit in an aqueous state in at least one of the compounds $NaBH_4$, KBH_4 and $LiBH_4$, which release hydrogen in the presence of a selected catalyst.

36. The energy supply station of claim 1 or 2, further comprising two or more chemical converters, said chemical converters including a steam reformer and a high temperature fuel cell, wherein the capacity of each is determined by the thermal energy matching characteristics of the fuel cell and reformer without requiring additional combustion heating, wherein reformer performs an endothermic reforming reaction and the fuel cell performs an exothermic reaction, wherein the reformer has a capacity larger than the chemical matching needs of the fuel cell, thereby allowing excess reformed fuel generated by the reformer to be made available for hydrogen production.

37. The energy supply station of claim 1 or 2, further comprising a plurality of chemical converters, wherein said chemical converters include a reformer for reforming the fuel into hydrogen and a fuel cell for generating electricity, wherein the ratio of the co-production of electrical energy to hydrogen energy is about 2 to 1.

38. The energy supply station of claim 1 or 2, further comprising a plurality of chemical converters, wherein said chemical converters include a reformer for reforming the fuel into hydrogen and a fuel cell for generating electricity, wherein the station can be operated in a first condition for producing less hydrogen with said reformer to lower co-production efficiency, or in a second condition for producing less electricity with said fuel cell, thereby requiring thermal energy from a combustion process for supporting the reforming process of the reformer to achieve low CO_2 emission levels.

39. The energy supply station of claim 2, further comprising a collection unit for collecting the carbon dioxide in the output medium before being disposed of.

40. The energy supply station of claim 2, wherein said storage element comprises a composite, polymer-lined storage tank.

41. A method for co-producing hydrogen and electricity in a station from a hydrocarbon fuel, comprising the steps of

co-producing hydrogen and electricity with a plurality of chemical converters by processing the fuel to form an output medium having carbon dioxide,

separating a chemical component from the output medium, and

storing the hydrogen before being dispensed.

42. The method of claim 41, wherein the hydrocarbon fuel includes one of natural gas, coal gas, propane, naphtha, gasoline, diesel fuel, methanol and biogas.

43. The method of claim 41, further comprising the step of pre-treating the fuel prior to introduction to at least one of the chemical converters.

44. The method of claim 41, further comprising the step of heating and vaporizing a liquid reforming agent prior to introduction to at least one of the chemical converters.

45. The method of claim 41, further comprising the step of heating and evaporating the fuel prior to introduction to at least one of the chemical converters.

46. The method of claim 41, further comprising the step of vaporizing a liquid reforming agent prior to introduction to the chemical converters, wherein said vaporizer comprises a steam boiler or a heat recovery steam generator.

47. The method of claim 41, further comprising the step of vaporizing and mixing a reforming agent with the fuel.

48. The method of claim 47, further comprising the steps of providing a mixer for vaporizing and mixing the reforming agent and the fuel, and heating the reforming agent prior to introduction to the mixer.

49. The method of claim 41, wherein one or more of the chemical converters is a reformer and the output medium generated thereby includes hydrogen, water and carbon dioxide, wherein the step of separating comprises the step of individually isolating at least one of the hydrogen, water and carbon dioxide in the output medium.

50. The method of claim 41, wherein one or more of the chemical converters is a reformer, further comprising the step of supplying a reforming agent to the reformer for converting the fuel into hydrogen and carbon monoxide as the products of an intermediate reaction that occurs therein.

51. The method of claim 44, wherein the reforming agent is one of air, water and steam.

52. The method of claim 50, further comprising the step of treating the reforming agent prior to introduction to the reformer with a treatment stage.

53. The method of claim 52, wherein the treatment stage comprises a de-ionizer or a vaporizer.

54. The method of claim 53, wherein the de-ionizer processes the reforming agent with one of a de-ionizing resin and reverse osmosis.

55. The method of claim 41, wherein the chemical converters comprise at least one reformer and the output medium includes hydrogen, water and carbon dioxide, further comprising the step of delivering hydrogen to a vehicle through a vehicle interface.

56. The method of claim 41 or 49, wherein said chemical converters comprise at least one fuel cell, and wherein said fuel cell produces electricity.

57. The method of claim 56, further comprising the step of providing a vehicle interface adapted to exchange electricity between the vehicle and the station.

58. The method of claim 56, wherein the fuel cell is one of a solid oxide fuel cell, molten carbonate fuel cell, phosphoric acid fuel cell, alkaline fuel cell, and proton exchange membrane fuel cell.

59. The method of claim 41, further comprising the step of providing a generator for producing electricity.

60. The method of claim 59, wherein the generator comprises at least one of a fuel cell and a gas turbine, an internal combustion engine and a sterling engine assembly.

61. The method of claim 59, wherein the said generator comprises a fuel cell positioned to receive the hydrogen output of the reformer for electrochemically converting the hydrogen in the presence of an oxidant into electrical energy.

62. The method of claim 59, wherein the generator is a fuel cell, said fuel cell being one of a solid oxide fuel cell, molten carbonate fuel cell, phosphoric acid fuel cell, alkaline fuel cell, and proton exchange membrane fuel cell.

63. The method of claim 59, wherein said generator is selectively coupled to a vehicle interface for delivering electricity to a vehicle.

64. The method of claim 41, further comprising the step of inverting D.C. electricity generated by said chemical converter into AC current.

65. The method of claim 41, further comprising one or more of
a de-sulfurization unit for removing sulfur from the fuel or output medium,

at least one of a low and high temperature shift reactor for converting carbon monoxide and steam within the output medium into carbon dioxide and hydrogen, and

a hydrogen processor for processing hydrogen present within the output medium.

66. The method of claim 65, wherein the hydrogen processor comprises one of a mechanical compressor and an electrochemical compressor.

67. The method of claim 66, wherein the electrochemical compressor comprises one of a phosphoric acid, alkaline, and proton exchange membrane device.

68. The method of claim 41, wherein said output medium of said chemical converter includes steam, and wherein said step of separating comprises the step of condensing the steam from the output medium, thereby enabling the separation of hydrogen and carbon dioxide from the output medium.

69. The method of claim 41, wherein said separation step comprises the step of separating hydrogen from the output medium.

70. The method of claim 69, further comprising the step of isolating said hydrogen from said output medium by one of physical absorption, adsorption, low temperature distillation, high pressure liquefaction, membrane, enzyme, and molecular sieve separation of CO_2.

71. The method of claim 41, wherein said step of separating is performed with a separation stage, said separation stage comprising one or more of means for forming a liquid or solid hydrogen compound to isolate hydrogen therefrom; means for cooling the output medium of the chemical converter to separate hydrogen therefrom; means for pressurizing the output medium of the chemical converter to separate hydrogen therefrom; and means for membrane filtering the output medium of the chemical converter to separate hydrogen therefrom.

72. The method of claim 41, further comprising the step of storing hydrogen separated from the output medium.

73. The method of claim 41, further comprising the step of storing hydrogen separated from the output medium in a storage unit in one of a compressed gas state, solid state, aqueous state, and refrigerated state.

74. The method of claim 73, further comprising the step of storing said hydrogen in said storage unit in an aqueous state in at least one of the compounds $NaBH_4$, KBH_4 and $LiBH_4$, which release hydrogen in the presence of a selected catalyst.

75. The method of claim 41, wherein said chemical converters include a steam reformer and a high temperature fuel cell, further comprising the step of determining the capacity of said fuel cell and said reformer by the thermal energy matching characteristics of the fuel cell and reformer without requiring additional combustion heating, wherein the reformer performs an endothermic reforming reaction and the fuel cell performs an exothermic reaction, wherein the reformer has a capacity larger than the chemical matching needs of the fuel cell, thereby allowing excess reformed fuel generated by the reformer to be made available for hydrogen production.

76. The method of claim 41, wherein said chemical converters include a reformer for reforming the fuel into hydrogen and a fuel cell for generating electricity, wherein the ratio of the co-production of electrical energy to hydrogen is about 2 to 1.

77. The method of claim 41, wherein said chemical converters include a reformer for reforming the fuel into hydrogen and a fuel cell for generating electricity arranged in the station, wherein the station can be operated in a first condition for producing less hydrogen with said reformer to lower co-production efficiency, or in a second condition for producing less electricity with said fuel cell, thereby requiring thermal energy from a combustion process for supporting the reforming process of the reformer to achieve low CO_2 emission levels.

78. The method of claim 41, further comprising the step of collecting the carbon dioxide before being disposed of.

79. The method of claim 41, wherein said step of storing comprises the step of storing the hydrogen in a composite, polymer-lined storage tank.